

Alternative Measures of Business Entry and Exit.

Ronald S. Jarmin¹

Center for Economic Studies, U.S. Census Bureau

Javier Miranda²

Center for Economic Studies, U.S. Census Bureau and
American University

Kristin Sandusky³

Longitudinal Employer~Household Dynamics, U.S. Census Bureau

Draft

September 2, 2003

Abstract

This paper explores the implications of alternative definitions of business units for computing statistics on business entry and exit, and job creation and destruction in the United States. The goal of the analysis is to point to ways to harmonize comparisons of business demographics across different sources and types of data and across countries.

Using the Census Bureau's Longitudinal Business Database (LBD) we compare measures of entry, exit, turnover and job creation and destruction across three alternative definitions of a business unit. The LBD is an establishment level dataset with firm (enterprise) ownership information as well as detailed geographic, industry and establishment size information. This detailed information allows us to compute measures that are comparable to those obtained with data that are constrained to either establishment or enterprise units or where enterprise data are available only for smaller geographic units such as individual countries within the European Union or states in the case of ES-202 based data in the U.S.

Our first task will be to compare establishment and enterprise level results for all industrial sectors in scope for the LBD. Next, we will use the geographic information in the LBD to characterize enterprise entry, and exit under two alternative definitions. The first defines the enterprise at the state level. The second defines the enterprise at the national level.

¹ <mailto:ron.s.jarmin@census.gov>

² <mailto:javier.miranda@census.gov>

³ <mailto:Lee.K.Sandusky@census.gov>

Very Preliminary and Incomplete - Please do not quote or cite without permission

1. Introduction

The demand for statistics on business demography is increasing. The relative performance of the European and American economies over the last decade is spurring policy makers to demand and statistical agencies to collect statistics that will help them understand the factors that determine the creation and destruction of firms and the consequences that their policies may have on overall economic performance, employment and productivity growth.⁴ Firm entry and exit are believed to play an important role in this sense. The reallocation of jobs and factor inputs from low productivity firms to high productivity ones has been shown to play a significant role in accounting for aggregate productivity growth.⁵ New more efficient firms are also believed to be especially innovative and may play an important role as job creators and as test beds of new technologies. What are the factors that affect the ability of firms to innovate and grow? International comparisons of time series data on firm entry and exit and job turnover provide an obvious source of leverage for drawing inferences about the forces that may impinge on these processes.

To this end, the OECD and Eurostat are working together to develop a methodology for comparable statistics and indicators on enterprise birth, growth, survival and death. There has been considerable progress in this area and early results are promising. However, these efforts are hampered by the disparity in the sources and types of data.

This paper explores the implications of alternative definitions of business units for computing statistics on business entry and exit, and job creation and destruction in the United States. The goal of the analysis is to point to ways to harmonize comparisons of business demographics across different sources and types of data and across countries.

This paper uses the Census Bureau's Longitudinal Business Database (LBD) to compare measures of entry, exit, turnover and job creation and destruction across three alternative definitions of a business unit. The LBD is an establishment level dataset with firm (enterprise) ownership information as well as detailed geographic, industry and establishment size information. This detailed information allows us to compute measures that are comparable to those obtained with data that are constrained to either establishment or

⁴ Between 1990 and 2000, annual GDP growth averaged approximately 3.1% in the U.S. versus 2.1% in the European Union countries. Productivity growth increased at an average rate of 3.5% in the U.S versus X% in Europe. And, the annual unemployment rate averaged 5.6% in the U.S versus 10.7% in Europe. Source: Economic Report of the President, Eurostat, World Economic Indicators.

⁵ Some relevant papers in this area include Baily, Hulten and Campbell (1992), Olley and Pakes (1992) Griliches and Regev (1995), Baily, Bartelsman and Haltiwanger (1996, 1997), Foster, Haltiwanger and Krizan, (1998).

enterprise units or where enterprise data are available only for smaller geographic units such as individual countries within the European Union or states in the case of ES-202 based data in the U.S.

The last point is the focus of this paper. Work on the OECD Growth Project (Bartelsman et. al. 2003) has generated internationally comparable statistics related to producer dynamics. The project involved teams from several OECD countries using a harmonized methodology to compute various statistics using data from the business register maintained by national statistical offices. This cooperative strategy was used since OECD could not directly access the confidential micro data from each participating country.

The results from the OECD study suggest that while turnover rates in European countries were similar to those in the U.S., new firms in the U.S. were much smaller and grew much faster than those in Europe. These results have been used as evidence of a business climate in the U.S. that is more supportive of market experimentation and that this in turn helps explain better economic performance in the U.S.

The U.S. team on the project, which included two of us (Jarmin and Miranda), used an early prototype of the Longitudinal Business Database (LBD). Subsequent work with the LBD, however, has caused us to question the comparability of the results across countries even though great care was taken to maximize it. In particular, the methodology called for computing statistics at the firm level within each participating country. The U.S., however, is a very broad market compared to other countries. A firm located in California opening a location in New York would not be considered an entrant in the LBD. A firm in Finland opening a location in Portugal, on the other hand, would. In neither case a new firm is not created, but rather, existing firms are expanding in to new markets.

In this paper we perform a straightforward exercise to gauge the affect of different market definitions on the types of statistics computed in the OECD study. The LBD gives the ability to track firm activities at various levels of geographic and industrial classifications. Our first task will be to compare establishment and enterprise level results for all industrial sectors in scope for the LBD. Next, we will use the geographic information in the LBD to characterize enterprise entry, and exit under two alternative definitions. The first defines the enterprise at the state level. The second defines the enterprise at the national level.

2. Background

The nature of the data used to compute statistics on producer dynamics has important implications for how the statistics are interpreted. First, the data that are typically available for such uses (e.g., business register data) do not permit precise measurement of the theoretical concepts of interest to

economists. Second, differences in statistical methodology and legal environments mean that statistics computed from different data sources must be interpreted differently.

The concept of producer dynamics described in economics textbooks is pretty straightforward. Producer dynamics capture the entry and exit of sellers in some abstract market for a good or service. Theoretical models of markets describing the behavior of buyers and sellers in various market settings show that the structure (e.g., the number and size distribution of sellers) and the presence or absence of barriers to entry are important factors in determining how efficiently markets operate. Accordingly, much of the interest in empirical measures of producer dynamics has been stimulated by policies and laws designed to enhance market performance.

The empirical analyses of markets ideally require data at the firm - product level where product refers to some bundle of characteristics that would include location. However, such detailed data are rarely available. Thus, most empirical analyses of producer dynamics do not measure precisely the concepts delineated in textbooks that are important for understanding competition policy.

To aid in understanding what is measured in empirical studies of producer dynamics, let us consider two hypothetical firms. The simplest case is a single location firm that produces a single product that is sold locally. The other is a large multi-national firm that produces many diverse products in many locations within many countries. Locations (i.e., establishments) of the large firm produce goods or services that can be sold both in local markets and in global markets. The large multinational firm has several business divisions that have responsibility for one or more product lines. Some of these divisions manage operations within a single country and others manage operations in several nations.

With these two hypothetical firms in mind, let's consider how one would measure firm entry and exit data available from business registers maintained by national statistical offices as well as firm growth. Recall that the theoretical notion of firm entry and exit calls for measuring the entry into and exit from particular markets. This implies that measuring firm dynamics for all but the simplest firms requires detailed data on the markets in which multi product firms operate as they may be simultaneously entering and exiting from several individual markets.

First, consider the expansion of an existing firm. If a firm in the U.S. with establishments in one state expands into another, no firm entry will be recorded in the LBD, the source of the U.S. data used in the OECD study. However, if a German firm expands in to France, there will be a firm entry recorded in the French data. This same example would hold for comparing firm turnover measures obtain for the U.S. from the Census and BLS data since the BLS data are based on ES-202 files provided by the individual states. Second, a surviving entrant in the U.S. has a much larger market in which to expand suggesting that

we might expect to see higher post entry growth in the U.S. This will result simply from the fact that establishments opening in distant geographic locations are identified as belonging to the same firm.

So the question then becomes twofold. First, how should one delineate markets using the information available in business registers and other similar data sources? Most markets have fuzzy boundaries, so asking business register data to accurately delineate them may be a tall proposition. In practice, researchers use some combination of product, industrial and geographical classifications to group the units measured in business registers into markets, if we define markets rather crudely using the product, industrial and geographical typically available on business register files. Second, what is the statistical unit we are measuring? In some cases, establishments (or local units) are tracked, in other cases legal units, which correspond to some sub-unit of a firm, are tracked and finally sometimes firms are tracked. Clearly, the statistical unit tracked on business register have important implications for measures of firm dynamics. Even when similar statistical units are employed there are often differences in the type and quality of the information attached to them. These can include differences in industrial classifications or in the availability of key data items such as detailed inputs and outputs and firm affiliations. The data items tracked in business registers determine the ability of researchers to analyze the activity larger more complex firms that operate in multiple markets. In particular, the level of detail maintained on the products and services produced by the firms, its use of factor inputs and the locations of its establishments directly affect the ability of statistical agencies to accurately assign firms or portions of firms to particular product, industrial and geographical classifications.

The answers to these questions will determine how precisely researchers can measure theoretically sound measures of producer dynamics using business register data. These can vary considerably across different data sources further complicating attempts to do comparative analyses considerably.

3. Empirical Exercise

Our goal is to use an empirical exercise to show how measures of producer dynamics are sensitive to the data and methodology used to compute them. The exercise is designed to gauge the comparability of measures of firm turnover and post entry employment growth obtained from different sources and focus on the feasibility of doing international comparisons of such statistics. In addition, we are interested in comparing these measures using the two alternative sources of longitudinally linked business register data for the U.S.: the Census Bureau's Longitudinal Business Database (LBD) and the Bureau of Labor Statistics Longitudinal Database.

The starting point of the analysis is to note that the geographic scope of

the "market" to which firms enter, grow and exit differs between different data sources. The countries that participated in the OECD Growth Project's Firm Level Study vary by size with the U.S. being the obvious outlier. The OECD study found that firm turnover rates were roughly comparable across the U.S. and several European countries, but post entry growth for surviving firms was much larger in the U.S.

How could differences in the geographic scope of the U.S. national market and those of the European nations involved in the study affect these results? For this exercise we focus on three measures that received a lot of attention in the OECD study: firm turnover (entry plus exit) rates, the size of firm entrants and post entry firm growth. The results from the OECD study suggested that while turnover rates in European countries were similar to those in the U.S., new firms in the U.S. were much smaller and grew much faster than those in Europe. Our aim here is to gauge how these results are affected by data and measurement issues.

A. Data and Measurement Issues

We compute these statistics using data from the Longitudinal Business Database (LBD). The LBD contains longitudinally linked establishment level business register data for all private non-farm sectors of the economy. The establishment data include firm ownership information and detailed industrial and geographic codes. A detailed description of the LBD is available in Jarmin and Miranda (2002).

The LBD is useful for this exercise since we are able to measure the activities of firm at both the national market level and the state market level.

We use the LBD to compute measures of business entry and exit and job creation and destruction following the same basic methodology used by Dunne, Roberts, and Samuelson (1988, 1989). Given the population of active business units in each of two time periods, t and $t+1$, we first classify businesses that appear in period $t+1$ but not in period t as births. We classify businesses that appear in period t but not in period $t+1$ as deaths. Finally, we classify businesses that appear in period t and $t+1$ as continuers.⁶ With this classification we then construct measures of entry, exit and job creation and destruction as follows.

The entry rate, ER, is defined as the number of business entities that enter between census year t and year $t+1$ divided by the number of businesses in year t . The exit rate, XR, is defined as the number of business entities that exit between year t and year $t+1$ divided by the number of businesses in year t . The turnover rate, TR, is defined as the sum of the entry and exit rate.

We exploit the employment information to construct measures of job

⁶ The term business unit is used rather loosely here. The term refers to establishments, state-firm units or the national firm units depending on the definition and size of the geographic market we consider.

creation and destruction. The gross employment flow rate resulting from business entries, the entrant market share (ESH), is the number of employees in businesses that enter between census year t and year $t+1$ divided by the employment in year $t+1$. The gross employment flow rate resulting from business closings, the exit market share (XSH), is the number of employees in businesses that exit between year t and year $t+1$ divided by the employment in year t . Job creation rate at continuing establishments, JCRc, is the employment gain of businesses that expand between period t and $t+1$ divided by employment in period t , while the job destruction rate at continuing establishments, JDRc, is the employment gain of businesses that contract between period t and $t+1$ divided by employment in period t . In this context the job turnover rate is defined as the sum of the entry share, the exit share and the job creation and destruction rates of continuers.

We exploit the employment information also to construct measures of business size. We define the entrant relative size (ERS) as the average employment of an entering business unit divided by the average size of incumbent businesses in year $t+1$. The exit relative size (XRS) is the average employment of exiting businesses divided by the average size of surviving businesses in year t . We track the relative employment growth of continuing establishments by following the evolution of particular cohorts.

The detailed establishment level data in the LBD allow us to measure a variety of entry and exit statistics. In particular, it is possible to construct both establishment and firm entry and exit rates with the LBD. These statistics can be computed for the U.S. as a whole, for particular regions and for particular sectors and industries. Differences in definitions and characteristics of the data mean that different measures will yield different results. To illustrate this point table 1 provides the total number of establishments, firms and firms defined at the state level for particular Census years.

The data set used in this paper to measure firm and job turnover consists of every U.S. employer establishment in scope of the economic Census. The data is derived from the Business Register files and cover the years between 1976 and 2000. The data include the total employment in each plant, the two-digit SIC industry and the detailed geographic codes where the plant is located. The data cover over 4.6 million unique establishments each year and over 3.9 million unique firms. The share of firms that operate in multiple states is relatively low. However, these are by far the largest firms and their share of total employment is relatively high and growing in magnitude.

Several strengths and weaknesses of the data must be recognized when computing turnover flows. First, establishments are linked over time using plant identification numbers as well as probabilistic name and address matching. As a result, spurious establishment entry and exit that may result from firm mergers and acquisitions are not a problem here. The same is not true when it comes to

firm identifiers. Spurious firm entry and exit due to reorganizations are possible in the data. The discrepancy in the way establishments and firms are treated may bias upward the differences between firm and establishment turnover.

Detailed geographic codes are available for each establishment down to the county and zip code. Analysis of geographic codes (Miranda 2001) shows that there are inconsistencies in the way these codes are assigned for roughly 4% of establishments. These inconsistencies typically involve multiple transitions across county lines. Movements back and forth across county lines result from changes in the underlying geographic street-mapping codes and do not involve the physical relocation of establishments. We limit the effect that these spurious transitions have on entry and exit by selecting the geographic codes assigned during a census year whenever possible. We assign their modal codes to establishments that do not survive through a census year. These codes are also used to assign the location of multiunit plants.

Establishments are assigned a 4-digit SIC code based on response data. Unlike geographic location, the industry of activity can legitimately change if the predominant output of the establishment changes. A complete industry level analysis of entry and exit would have to take these changes into consideration (see Jarmin, Klimek and Miranda 2002 for an application). An establishment that transitions into a new industry would have to be counted as an exit from the old industry and an entry into the new one. However, for the purposes of this paper we follow the methodology set forth by the OECD and simplify the analysis by assigning a predominant 2-digit SIC code to each establishment. We follow the same procedure to assign a predominant 2-digit SIC code to each firm. This simplification will clearly lead to lower turnover rates than those that would be obtained were we to consider entry and exits into particular industries.

A major strength of the LBD is that it includes all industrial sectors. However, we restrict the analysis to industries that are in scope of the economic census and exclude agriculture and governments, forestry, rail transportation, and employment by private households. All changes in 2-digit SIC industry definitions over time are incorporated into the establishment-level data so that industries are consistently defined using either the 1972 or 1987 definitions.⁷ All flows reported in the paper are the average of the flows at the 2-digit SIC level. Another strength of the data is that it includes all employer establishments. Business registers such as the one in France exclude small employers. These registers will miss turnover from entry and exit of small firms. There is no cut off threshold for inclusion in the LBD providing a fuller picture of turnover in the economy.

The data used in this study include total employment in each establishment. Employers are required to provide the total number of employees

⁷ The resulting classification is a mix of the 1972 and 1987 SIC classification.

present on March 12 in a given year. Consequently, firms that start operations after March 12 of a given year report zero employment for that year. As before, we follow the methodology in the OECD and impute March 12 employment for these establishments.

Another strength of the data is the continuous length of coverage. The business register is available between 1975 and 2000. As a result it is possible to compute flows on a year-to-year bases.

B. Turnover Rates

Basic Findings:

1. Turnover rates are smaller for establishments than for firms (Figure 1). This is to be expected since establishments that change ownership do not generate an exit and an entry event in the LBD. The same is not true for firms. Changes in firm ownership do generate turnover. Establishment turnover rates are approximately 11% lower than corresponding firm turnover rates.
2. Unweighted turnover rates are not sensitive to the way we define the firm; whether at the nation or state levels (Figure 1). This is not surprising given the relative small number of firms that operate across multiple states (see Table 1).
3. Turnover rates weighted by employment are lower than strict firm turnover rates (Figure 2). This reflects the fact that the process of entry and exit of firms involves a proportionally low number of workers but a large number of small firms.
4. Measures of turnover weighted by employment are sensitive to the way we identify the firm unit. Turnover is significantly higher when firms are identified at the state level relative to the nation. The share of firms that operate in multiple states is relatively small; however, they encompass a relatively high proportion of all employment (see Table 1). Entry and exit of firms across states lead to turnover rates that are approximately 20% higher. These differences are likely to increase given the growing share of employment that is encompassed by firms that operate across multiple states. Figure 2 suggests this might be the case.
5. Job turnover rates are sensitive to definition for the same reason. Job turnover rates are approximately 10% higher when we identify firms at the state versus the nation.

C. Size of Entrants

Basic Findings

1. Size statistics are sensitive to choice of business unit. Entry size is sensitive to choice of unit and geographic market.
2. Table 2 shows that the average number of employees in firms that start operation in 1977 is 12.4. By contrast, the average number of employees of firms entering a state market is 13.7. Differences in average size arise because firms that expand into neighboring markets do so with establishments that are on average larger than those created by true new firms and because the choice of geographic market area affects the identification of particular entry/exit events. To see this more clearly note that when a firm's market boundary is defined by the nation then the expansion of long-lived firms into smaller geographic markets such as a particular state will not be computed as an entry event. These establishments are on average larger than new firms. The same is not true when a firm's market boundary is defined by the state. In this case expansions into a different state will result in the identification of an entry event even though the firm was previously operating in a different state.
3. Table 2 shows that this size effect, while not big, persists in successive cohorts.
4. Measuring firms within smaller markets (e.g. States) leads to overestimates of entry size statistics. The state level estimates include the expansion of successful firms into neighboring markets. New establishments of existing firms tend to be above average size. This bias could contribute to the finding that U.S. firms, measured at the national level, enter at a smaller average size than firms in particular European nations.

D. Post Entry Growth

Basic Findings

1. The expansion of operations into neighboring states is a significant contributor to firm growth. Figure 4 depicts average growth of firms, firm-states and establishments for different cohorts of entrants. It shows that about 1/3rd of total firm growth experienced by the 1977 cohort is due to firms branching into neighboring states. In particular, firms born in 1977 that survive through 1997 on average tripled their size over this 20-year period. By contrast, on average firms only doubled their size in their local markets (defined by the state).

2. Limiting firm growth to particular local markets such as a state or presumably a small nation (as would be the case in the Europe) results in a significant underestimation of firm growth. These estimates miss the expansion of large successful firms into neighboring markets. This could help explain in part the finding that firms in the U.S. grow significantly more than firms in European countries.

5.Implications

In this paper we have demonstrated that measures of producer dynamics are sensitive to the definition of the "markets" firm operate in. Our simple empirical exercise compared results for the U.S. obtained using state and national level market definitions. This is intended to artificially mimic the comparisons in the OECD study. We find that significant impacts on several key statistics. For example, we find that turnover rates (especially when weighted by employment) are higher when we use state level market definitions. We also find that the initial size of entrants is larger when measuring at the state level and that firm growth over time is smaller.

This clouds the interpretation of the results from the OECD study since, our results suggest that turnover rates and the size of entrants for European countries might be smaller if one could track firms operating several countries. We do not believe our results change the qualitative findings of the OECD study; however, they do suggest we exercise extreme caution when comparing the magnitude of the differences between the U.S. and European statistics.

What does this imply for future international comparisons of producer dynamics? We believe that it is important to compare producer dynamics for similar market settings. Thus, we may want to focus on well-defined markets such as local retail markets. Unfortunately, this increases the data requirements. In particular, establishment level data are necessary to track firm activities in local markets. Many countries do not have establishment level data on their business registers.

References

- Baily, M., C. Hulten and D. Campbell (1992), "Productivity Dynamics in Manufacturing Plants", Brookings Papers on Economic Activity: Microeconomics, 2, pp.187-249
- Baily, M., E. Bartelsman and J. Haltiwanger (1997), "Labor Productivity: Structural Change and Cyclical Dynamics", NBER Working Paper Series, No. 5503
- Bartelsman, E., S. Scarpetta and F. Schivardi (2003), "Comparative Analysis of Firm

Very Preliminary and Incomplete - Please do not quote or cite without permission

Demographics and Survival: Micro-Level Evidence for The OECD Countries", OECD Economics Department, Working Paper No. 348

Dunne, T., M. Roberts and L. Samuelson (1988), "Patterns of Firm Entry and Exit in U.S. Manufacturing Industries", RAND Journal of Economics, Vol. 19, No. 4, pp. 495-515

Dunne, T., M. Roberts and L. Samuelson (1989), "Plant Turnover and Gross Employment Flows in the U.S. Manufacturing", Journal of Labor Economics, Vol. 7, Issue 1, pp.48-71

Foster, L., J. Haltiwanger and C.J. Krizan (1998), "Aggregate Productivity Growth: Lessons from Microeconomic Evidence", NBER Working paper, No. 6803.

Griliches, Z and H. Regev (1995), "Firm Productivity in Israeli Industry, 1979- 1988", Journal of Econometrics, Vol. 65, pp.175-203

Jarmin, R. S. Klimek and J. Miranda (2002), "Firm Entry and Exit in the U.S. Retail Sector", Center for Economic Studies, Working Paper (Forthcoming)

Jarmin, R. and J. Miranda, "The Longitudinal Business Database", Center for Economic Studies, Working Paper No. 02-17

Miranda, J. (2001), "LBD Documentation: Geography Coding", Center for Economic Studies, Technical Document

Olley, S., and A. Pakes (1992), "The Dynamics of Productivity in the Telecommunications Equipment Industry", Center for Economic Studies, Working Paper 92-2.

Very Preliminary and Incomplete - Please do not quote or cite without permission

TABLE 1: Number of Establishments and Firms: 1977, 1982, 1987, 1992, 1997

Year	Establishments	Firm-state business units	Firm units	Firm-state units associated to multi-state firms	Share of Firm-state units associated to multi-state firms	Share of Employment by Multi-state Firms
1977	4,656,742	3,926,831	3,827,383	131,156	3.34	16.51
1982	4,884,487	3,995,457	3,884,326	145,834	3.65	17.07
1987	5,552,964	4,548,549	4,419,720	168,751	3.71	16.94
1992	5,925,191	4,783,781	4,633,060	198,049	4.14	18.10
1997	6,480,320	5,259,640	5,093,868	215,119	4.09	20.34

Source: Own Calculations from LBD data.

Table 2: Average entry size and Growth (as a ratio of entry level employment): by Establishment, Firm and Firm-State.

Cohort	Year	Establishment		Firm-State		Firm	
		Av. Size	Growth	Av. Size	Growth	Av. Size	Growth
77	77	14.51	1.00	13.71	1.00	12.40	1.00
77	82	27.58	1.82	23.53	1.70	20.30	1.75
77	87	28.59	2.13	31.26	2.26	28.75	2.54
77	92	37.09	2.64	36.59	2.61	37.65	3.27
77	97	38.02	2.77	40.94	3.05	49.08	4.27
82	82	26.58	1.03	19.53	1.00	16.00	1.00
82	87	37.54	1.42	27.06	1.36	23.32	1.42
82	92	67.64	1.68	38.40	1.74	36.82	1.97
82	97	40.71	2.06	38.71	2.02	36.62	2.36
87	87	17.31	1.00	20.35	1.00	19.06	1.00
87	92	23.99	1.40	27.71	1.31	27.11	1.38
87	97	30.18	1.73	34.67	1.65	37.02	1.84
92	92	15.65	1.00	19.66	1.00	18.12	1.00
92	97	22.75	1.44	26.81	1.45	25.58	1.52
97	97	16.26	1.00	22.95	1.00	21.95	1.00

Source: Own Calculations from LBD data.

Very Preliminary and Incomplete - Please do not quote or cite without permission

Figure 1. Turnover Rate: by Establishment, Firm and Firm-State

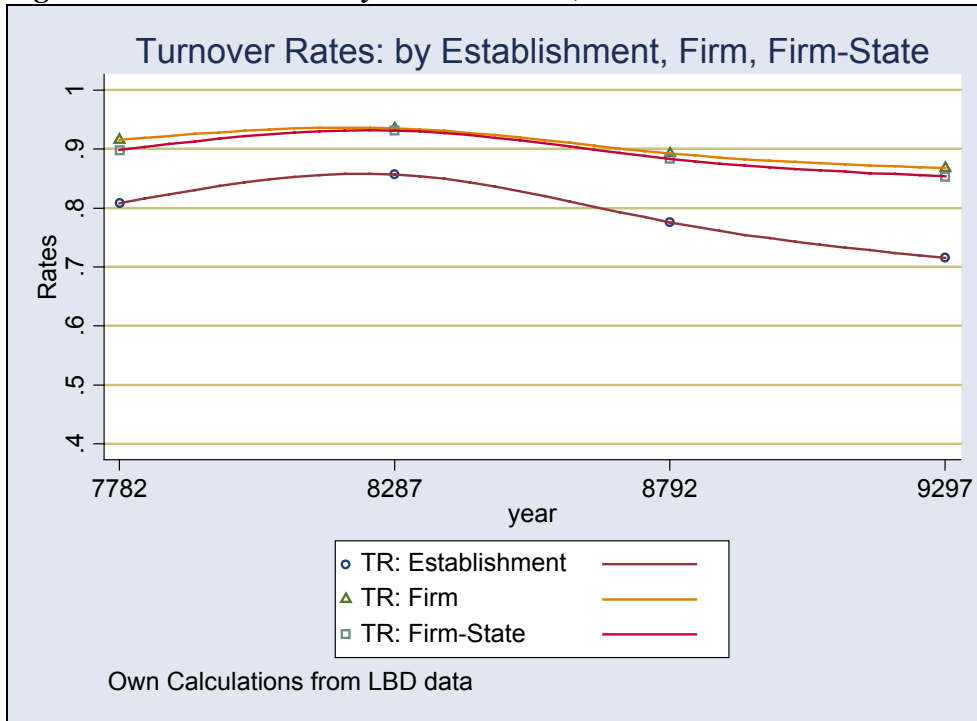


Figure 2. Turnover Rate Weighted by Employment: by Establishment, Firm and Firm-State

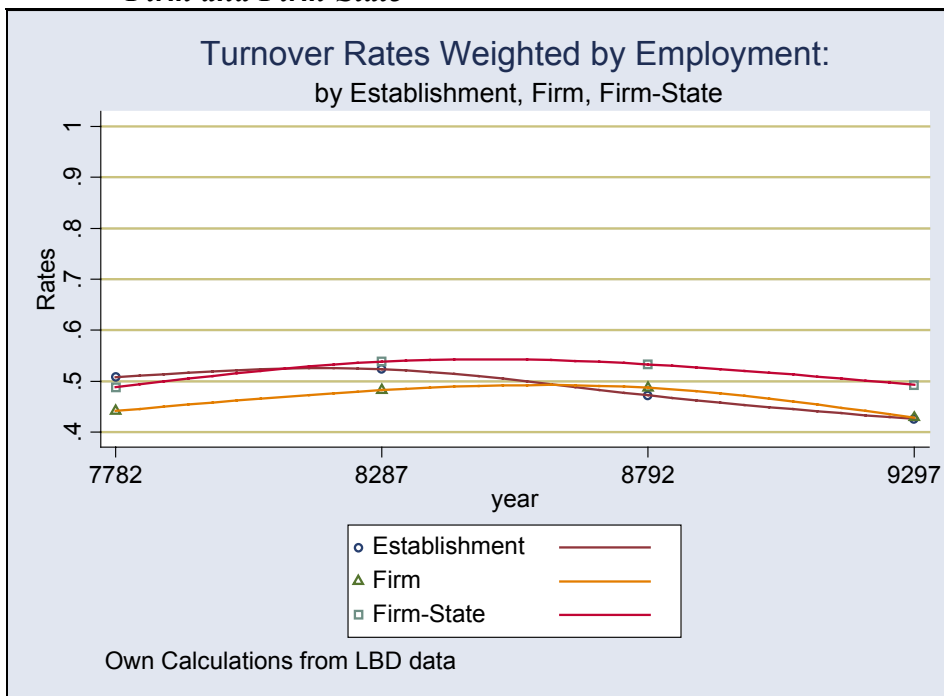
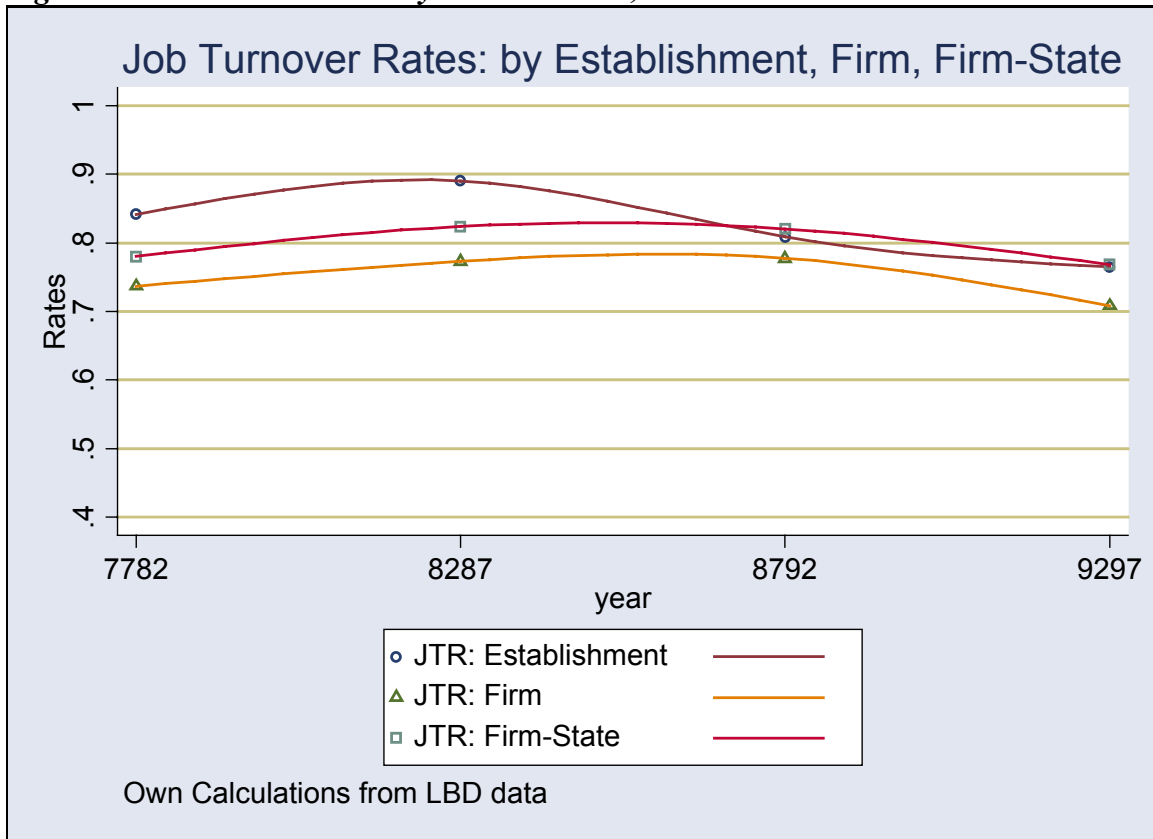


Figure 3. Job Turnover Rate: by Establishment, Firm and Firm-State



Very Preliminary and Incomplete - Please do not quote or cite without permission

Figure 4. Relative Size of Survivors: by Establishment, Firm, Firm-State (1977 Cohort)

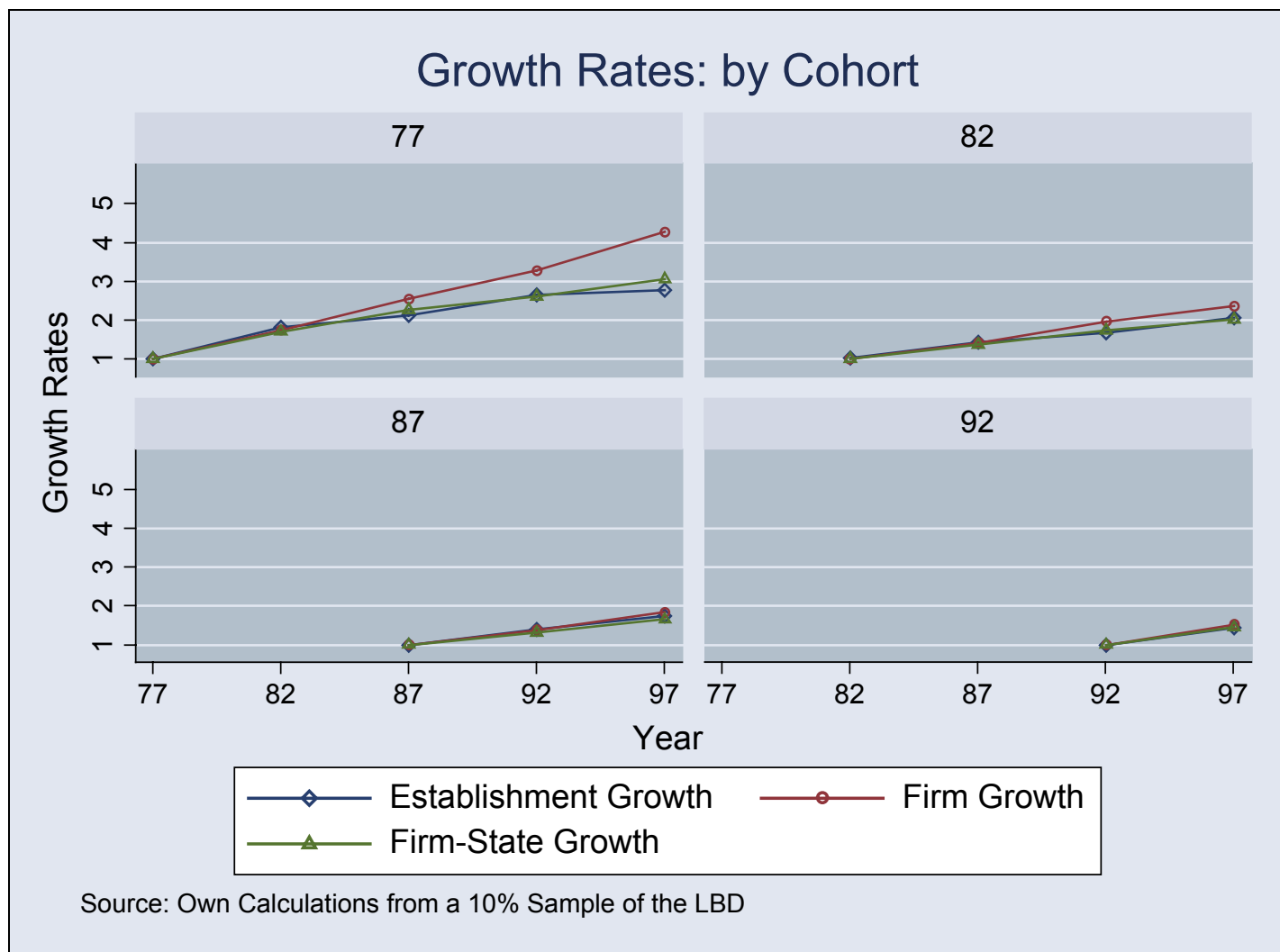


Figure 5. Exit Rates: by Establishment, Firm, Firm-State (1977 Cohort)

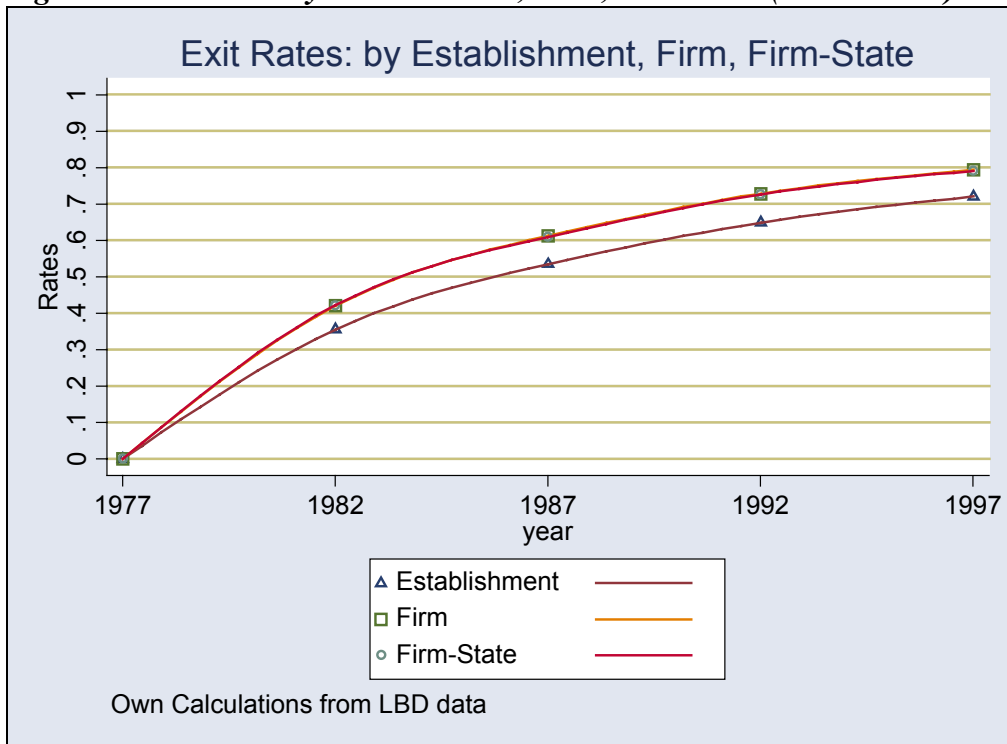


Figure 6. Survival Rates Weighted by Employment: by Establishment, Firm, Firm-State (1977 Cohort)

